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A NATIONAL SUGAR INDUSTRY - TO IMPORT AND REFINE OR TO GROW AND MANUFACTURE [1]

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C O N T E N T S

World tonnage output of white sugar is 25-30 per cent of milled rice production and 20 per cent of wheat. Sugar was usually sold at two to three times the price of wheat per ton and about double the price of milled rice, until the widespread drought of 1972 caused the price of rice to increase out of proportion.

Production of white sugar has been increasing at nearly 4 per cent compound a year from 1957 to 1972, from 40m. to 70m tons a year, while a very consistent 43 per cent of it has been derived from sugar beet, the rest of it being from sugar cane.

The projected rate of increase is now about 2.7m. tons a year, which is the output of 45 large factories, each making 60,000 tons a year.

Of the 122 countries listed in the 1972 year book of the International Sugar Organisation, 23 produce no sugar at all and many others import some of their requirements, either as raw sugar, which is brown to black in colour, for home refining, or as white sugar ready for the retail market.

A large, but unrecorded amount of sugar cane is grown in the Indian sub-continent and a great deal of it is processed as a cottage industry, the crops in tiny plots of a few hundred square metres. This cane is crudely milled by bullock power and the juices boiled down to a nutritious sticky brown mass of crystals, using the crushed cane fibres (bagasse) as fuel. This bagasse contains upwards of a quarter of the sugar juices of the cane so this extensive village industry is

a wasteful one in comparison with modern large mills which extract over 90 per cent of the sugar in the forms of crystallised sugar and molasses.

Annual consumption of white sugar a head is rising slowly and is nearly 20 kg. But with the hundreds of millions of the Indian sub-continent eating their sugar from the village industries, overall sugar consumption must be appreciably higher.

Sugar beet is a large-scale intensive annual crop grown only for industrial-scale processing. It lacks fuel as a by-product, unlike cane, and has no attractions for a village industry. Beet is normally considered to be a temperate crop and it is grown in Finland, over 60 degrees north of the equator. For a long time its cultivation was believed to be commercially impossible within 32 degrees of the equator, due to its need for long summer days for growth. However, experiments in the Indian sub-continent are showing that some varieties will grow successfully as spring crops south of the Himalayas and also on the south Indian plateau down to about 14 degrees north of the equator.

The beet ripens by the time the cane crop has been harvested. The beet is then fed to special beet equipment for the extraction of its sugar-bearing juice which is very similar to cane juice. The processing of the beet juice to crystal sugar and molasses is virtually identical with cane

juice and enables the large investment in a factory to be profitably employed for an extra month or so a year, during which fresh cane can no longer be supplied.

For a country starting or extending its sugar industry, the options can be seen to be wide, ranging from the simple building of a refinery supplied with imported raw sugar, to growing both cane and beet for factory processing into white sugar and supplementing these local crops with imported raw sugar for refining outside the two harvesting seasons.

TO IMPORT R TO GROW

The basic decision is whether to depend on other countries with surpluses of raw sugar to supply the new home refinery or to grow beet or cane, or even both, to supply a fully fledged factory which will need equipment for extracting, clarifying, and evaporating the juices as well as the refinery's equipment for crystallising out the sugar from the thick sugary liquid.

The open market for raw sugar is one of the most volatile in the world and London prices per long ton have ranged from £18 in 1966 to £150 at the time of writing, a ratio of one to eight. The reason is that 85 per cent of the sugar made, raw or white, has closed markets with guaranteed prices. A bad crop year can cut the average free market input of say 10m tons to 5m . and the resultant pressure on free stocks causes the price to rocket. The free market price of sugar is also particularly sensitive to any risk of a major war. With peace re-established firmly and several good crops, the price has collapsed to below the cost of production in 1961 and 1965-66.

It is clear that a sugar refinery as the starting point of a national sugar industry is a most unpredictable investment

prospect unless reliable long-term agreements can be concluded with countries with large surpluses of raw sugar.

One advantage of a refinery is that it can operate throughout the year, unlike most beet or cane factories which are generally limited to harvesting seasons of only four to six months. The daily output capacity of a refinery need only be half or a third of a factory fed with beet or cane. Also, the refinery does not have very expensive equipment needed for extracting the sugar juices. The foreign exchange cost of a refinery is therefore likely to be about a quarter of a complete factory with the same annual production of sugar.

In view of the accelerated world-wide inflation, it is not possible to quote very firm figures but a factory making 60,000 tons of sugar a year from cane or beet might cost say £8m . of which the foreign exchange would be £5m . An equivalent refinery, to cover losses, would need about 66,000 tons a year of raw sugar, costing today about £10m . and still £6.6m . if the price returns to a more realistic level of £100 a ton. This is far in excess of the once-off saving in foreign exchange of purchasing a refinery at £1.25m instead of a complete factory of the same annual sugar output at £5m .

Even if raw sugar could be regularly obtained at the recent Commonwealth Sugar Agreement price of £50 to £60 a ton plus freight, the imports of raw sugar would cost about £4m . a year, still more than the once-off saving in foreign exchange capital cost of the refinery compared with a complete factory.

The argument, so far, is clearly against importing raw sugar, but it assumes that a sugar crop can be grown in the home country. This assumption now requires examination. It rests on the availability of both agricultural land and rainfall or irrigation.

Both cane and beet have been intensively developed during the 20th century, particularly beet. A modern beet crop is usually 38-43 tons a hectare from which the factory extracts 5 tons of crystal sugar. This is half as high again as the standards of even twenty years ago, at the same levels of cultivation. A cane crop of 100 tons a hectare is nothing unusual now, with enough irrigation and fertilisers, and 10 tons of crystal sugar can be extracted from it. But a peasant's crop, with no artificial and little natural fertiliser and depending on irregular rain, is likely to be only 25 to 40 tons a hectare yielding as little as 2½ to 3 tons of sugar in the factory.

Unoccupied land capable of growing cane sugar without irrigation hardly exists any more. In starting a new area of cane, the choice lies between surface, or gravity, irrigation or overhead spray irrigation. The latter method surprisingly needs far less water than any other form of surface irrigation, which may use over 2,500mm. a year. On land with poor drainage this reduced water is a valuable feature as there is far less tendency for salts in the soil to rise and reduce the yields and render the soil sterile in time. Cane is particularly allergic to salt in the soil, unlike beet which has been developed from a sea-shore root.

In comparing beet and cane crops, it must be remembered that beet occupies the land for six to nine months, and land that has been used for early harvested beet can be quickly prepared for a winter cereal or a forage crop. Beet will grow well in temperate countries in deep soils where the annual rainfall is under 600mm. and without irrigation. Cane, an annual grass, takes a full twelve months to mature but then produces another crop, called a ratoon, a year later and it may go on ratooning for years, usually at successively lower yields.

In spite of these extreme differences between a tropical

grass and a temperate root as sources of such similar sugar bearing juices, each is likely to contribute 60 to 70 per cent of the total factory cost of the sugar. In other words, the sugar manufacturing process adds about 50 per cent to the agricultural costs of a ton of sugar.

The fibre in cane after it is milled provides more than enough boiler fuel to provide all the power and process steam required. Beet produces no fuel but it has a valuable by-product, its solid but edible soft fibre, called pulp, which when dried with fossil fuel, becomes a dehydrated cattle food selling at nearly the same price per ton as feed barley. This pulp is more nutritious and palatable if a little of the other main by-product, molasses, is absorbed in it. The quantity then produced is over 60 per cent by weight in comparison with the sugar and adds about a quarter to the factory's receipts from sales of sugar only. Sales of beet pulp handsomely exceed the factory's fuel costs.

The large leafy green tops of beet are cut off in the field and can be carted and ensilaged or fed in the field, slightly wilted, to cattle, sheep or goats. This is a particularly valuable by-product of beet in the dry countries and in the sub-tropics, when no natural green fodder still

remains by the time of the beet harvest.

Cane tops, sliced off and discarded at harvest, can also be fed to animals but the labour of collecting and taking them from the cane field is considerable and not really economic, in most circumstances.

When world markets are in balance despite some inevitable inflation, the value of a sugar crop per hectare is likely to be at least twice that of a cereal crop grown on the same land, both at the same standards of cultivation. In developing countries, the sugar farmers normally receive more agricultural credits and advice than they do for their original cereal or fodder crops and crop values per hectare have been known to rise by a factor of three or even four. This help for the sugar crops usually comes from the factory owners whose processing operations benefit from ample high quality crops; a simple example of enlightened self-interest.

The result of a big increase in farm sales per hectare may or may not be a corresponding increase in farm net profits but it inevitably means far more money passing through the hands of the farmer. The high standards of cultivation encouraged and usually paid for by the factory means more labour and material inputs per hectare for cultivation,

harvesting and transport to the factory. A cane sugar crop can weigh up to 50 times as much as a middling cereal crop per hectare and even beet is likely to weigh 20 times as much.

A farmer accustomed to receiving £50 a hectare for his under-fertilised wheat or maize finds himself selling his hectare of sugar crop for £200 to £400, most of which he has disbursed or committed already for extra labour, fertiliser, use of machinery, transportation and other inputs and loan interest yet to be paid. Whether he then has a gross profit of £25 or £100 to spend exactly as he likes makes no real difference to the national economy. His priorities are likely to be more varied food, better clothing and house-hold goods, probably all of local manufacture in any country that is capable of growing a sugar crop.

The really important point is not what he buys - whether for farm capital, crop input or just for a higher living standard - but that he is a far greater market for the rest of his countrymen. And not for goods only; he will spend more on services too; a bigger bank loan to pay interest on, more local and national taxes, more specialised farm and personal services.

GROSS PROFITS AND SECONDARY BENEFITS GAINED

It is not just his extra net or gross profit, say £50 a hectare instead of £20, that benefits his countryman. He will disburse his whole sales income, say £200 instead of £50 a hectare. Even if he has surplus cash, he is nowadays more likely to use a bank account for its safety rather than trying to obtain bullion to bury under his hearth. The bank will lend this access of funds again and again, so keeping it circulating to everyone's benefit.

It is universally accepted that any successful productive enterprise not only creates direct profits linked to the extra Gross National Product (GNP) but also so-called secondary benefits. These include the increased markets for goods and services resulting from the higher earnings of workers, the higher turnovers and therefore profits of manufacturers, merchants and retailers selling to the project and to each other, higher earnings of service workers and, of course, higher taxes.

Some economists prefer to work on the assumption that the amount of these secondary benefits is the same for any given amount of investment of whatever kind it is. Once this assumption is made, there is no point in trying to evaluate the secondary benefit in any particular investment because any alternative investment in the same place, and equally successful, would have the same secondary benefit. The assumption makes for speed and simplicity in comparing one

investment opportunity with another. Only the primary profitabilities need to be calculated over a period of years and discounted to their present values or to give the internal rates of return on the investment.

However, no known proof of the accuracy of this assumption has been either offered to, or discovered by, the writer and it does therefore seem to him to be in the same category of assumption as one held firmly, until quite a recent date in history, that the sun goes round the earth.

No complete calculations of secondary benefits of investments seem to have been made yet and indeed variables become so numerous that the task must be extremely difficult, even with the aid of a computer. The variables tend to be subjective ones too, particularly on forecasting what entirely new investments may be made if the initial investment is successful.

Nevertheless, the writer and a colleague made a start seven years ago on calculating the flow of cash that it appears must inevitably result if a productive investment, say upgrading cultivation on a group of farms, succeeds in increasing the gross farm sales, but without <u>further</u> outside investment. No algebra was involved, merely the mundane arithmetic of double-entry accounting.

CALCULATING REGIONAL SECONDARY BENEFITS

The model chosen here to illustrate the method is of a traditionally cereal growing area which has been changed over to continuous sugar cane at a higher standard of cultivation. The cane crop sales are £10,000 a working day higher than the sales were of cereals, say £4m . instead of £1m . for a 300 day year. This £4m worth of cane could represent the annual cane requirements of a big modern factory making 60,000 tons of sugar a year.

The farmers, and the farm-workers who of course receive some of the £4m . as wages, are assumed to spend all that money in the nearest market town at a steady rate throughout the year. This is the simplest possible case. The calculations for spending in a city, at intervals, as well as in the market town are also straight-forward, but much more voluminous and proportionally more difficult to explain in a short paper. Appendix I gives a typical calculation for what happens in the market town when the farming people spend the extra £10,000 a day from their sugar crop on farm inputs and personal requirements of goods and services.

A market town owes its existence entirely to its function of supplying its surrounding farms with goods which it obtains from ports and cities, and with service facilities which require no flow of outside supplies. The town's working

population naturally sell goods and services to each other as well as to the farmers. But if the farmers were to switch all their custom to another market town or to a city, the first town would die. There would be no cash flowing into that town to pay for the goods it needs for its own consumption and the citizens cannot make a living on exchanging their services - taking in each others' washing. By definition, a market town is not a manufacturing town.

The degree of increased prosperity of our model market town depends not only on the extra inflow of farm cash, taken as £10,000 a day, but on how much of that is spent on goods - which have to be replaced - and on services, which have not. Money spent by farmers on services circulates round the town initially, creating local income, GNP. But most of the money spent on goods, that is the wholesale cost of the goods, leaves the town quickly, to pay for replacements; only the gross profit remains and circulates. Therefore the higher the proportion of farm spending in the town on services, as against goods, the greater the gross profits of the merchants and the receipts of service workers, including the tax collector. This is the most important variable. Appendix I uses an 80/20 Goods/Service spending ratio for farmers, and for the townspeople too, for the sake of simplicity. The other variable, unexpectedly less important, is the weighted average mark-up

on goods sold in the town. This is about 33 per cent in the U.K. but it was found to be only slightly less in a major island of Indonesia and in South America; perhaps coincidences. Appendix I is based on a mark-up of 33.3 per cent.

Appendix II shows the effect of changes in these two variables on the secondary benefits, all GNP, created in the market town by farm spending of £10,000 a day. At the 80/20 Goods/Service ratio, (GSR), the secondary gross income created by the farm spending of £10,000 is £5,000 at a 20 per cent profit mark-up, about £6,100 at 30 per cent, and £7,400 at 40 per cent mark-ups, read off the graph. Appendix I calculates by double-entry that at 33.3 per cent mark-up, the gross profits of the shop-keepers are £4,333 (column 5) and receipts of service workers also happen to be £2,333 (column 6), both figures from the bottom line; total £6,666 and all GNP.

Another interesting point in Appendix I is the balance of trade; the amount of money leaving the town for replacement goods exactly equals the farm spending, columns 3 and 4, last line. This should occur, inevitably, at any goods/service ratio or profit mark-up. The farm money enters the town, some of it turns over repeatedly creating wealth, but all of it must leave the town for the purchase of wholesale goods, at the same average rate as it enters the town. Otherwise, the

town either runs into debt or accumulates idle cash or bullion.

Statistical data have been analysed to show that the GSR in the USA is about 50/50 and 60/40 in Great Britain; it ranges down to as low as 90/10 in an exceedingly poor but large group of shanty-town dwellers in South America. Prosperous small peasant farmers have been found with a GSR of 83/17.

Appendix II, using the 33.3 per cent mark-up, shows clearly that spending by farmers of £10,000 in the USA, 50/50 GSR, creates £16,600 of new wealth in their market towns, whereas farmers little above subsistence level with a 95/5 GSR create only £4,000 of new wealth in their market town.

By now it should be clear that the impacts of new productive capabilities on their immediate economic region can vary widely and should always be calculated. A manufacturing project which depends on importing its raw and other materials from outside its own region will do little good to that region. Similarly, a project importing its raw materials, etc., from abroad will produce little national benefit in relation to another consuming indigenous raw materials, and classical examples are sugar refineries importing raw sugar contrasted with sugar factories buying or growing their cane or beet in nearby areas.

CALCULATING NATIONAL SECONDARY BENEFITS WITHOUT FURTHER INVESTMENTS

The wealth created in manufacturing towns and cities, supplying the marketing town and purchasing the sugar production of the factory, can be calculated on similar lines to Appendix I. The increased demand for general goods by the market town enhances the profits in the city supplying the goods, whether the goods are of indigenous origin or imported. The city likewise acts as distributor for the sugar and earns a profit. It may, of course, lose its original profit on distributing imported sugar but the matter is calculable.

A full calculation for a typical case of greater farm sales output due to a well cultivated sugar crop, worth £4mn. a year instead of wheat worth £1mn. a year in a developing country, would be secondary GNP of 150 per cent on the £3mn. growth of primary GNP, another £4.5mn., all of it arising in urban areas. In a developed country, the benefit to urban areas would be about twice as high, due to their greater relative spending on services instead of on goods.

The change-over from wheat to sugar beet does not necessarily call for great capital expenditure, but if irrigated cane replaces unirrigated wheat, capital expenditure will normally be heavy. Of course, the availability of irrigation enhances the value of the land.

A calculation of the inevitable secondary benefits derived from a successful sugar factory project, which is combined with a switch from a £1mn. a year wheat harvest to a £4m a year sugar crop, covers half a dozen large pages. It starts with an analysis of all the annual expenditure of the sugar factory to obtain its goods/service ratio; the importance of this ratio has already been explained. Any labour-intensive factory naturally has a relatively low goods/service ratio and it consequently generates more secondary benefits than a capital-intensive factory.

With under-employment combined with the more obvious unemployment both rising in developing countries, (recently calculated at 50 per cent of the available labour force by the writer, for a Far Eastern country), the industries they select should not only use indigenous raw materials but be inherently labour-intensive.

The secondary benefits are all in the form of local employment, in the final analysis. A subsistence farming family does nothing to help the national economy and may be a net liability, whereas a prosperous peasant family, having a good surplus for sale and therefore with money to spend, can hardly help creating conditions which will keep two non-peasant families in similar comfortable conditions. The prosperous peasant is

a market for goods and services, unlike the subsistence farmer. Better one prosperous peasant family starting a chain reaction of non-farming employment for two other families, then all three families just able to subsist.

A £15m sugar project, including some irrigation, could produce £6m. worth of sugar a year at the factory price from cane costing £4m. The profit might be up to £1m. in 1974, but the inevitable secondary benefits to the urban and rural economics will normally lie between £10m. to £15m a year. In a particular instance, they have been calculated at £13m. a year (87 per cent on the investment), after allowing for the loss of a wheat crop worth £1m. and for almost £2m. of extra imports covering factory chemicals and spares, more agricultural inputs and consumer goods demanded by a more prosperous community.

A refinery for imported raw sugar and making the same quantity of white sugar, £6m. worth, is unlikely to create secondary benefits greater than the value of the refined sugar produced, £6m., before deducting the cost of the imported raw sugar, at least £4.5m., and also the cost of imports of refinery spares, materials, chemicals and increases in consumer goods. The annual net calculable secondary benefit is likely to be under £1m on a refinery investment of £2.5m. This is, say, 30-40 per cent against 87 per cent on the irrigation - sugar factory

of £15m . which showed £15m . a year net secondary benefits.

This enormous difference in the GNP as secondary benefits per £1m . of total investment, say £0.35m . against £0.87m ., is mainly because the refinery has to spend such a large proportion of its gross sales turnover on importing its raw material.

GENERAL POINTS FOR THE CONTROL OF A SUGAR INDUSTRY

In the Field

The costing and accounting controls for cane sugar estates and factories are often crude and far below the general level of those of beet sugar factories.

For both sources of sugar, it is essential to buy sugar and not just vegetable matter containing some sugar. The farmers should be paid for the sugar in their product as measured by sampling on delivery at the factory. A special bonus for higher than average sugar content can also work wonders on the sugar content of the harvests and it saves the factory expenditure in handling and processing some of the useless non-sugars.

If the factory grows its own sugar crop, each field should be, and sometimes is, standard costed individually. Its own actual and standard inputs of labour, machine time, including transport, seeds, fertilisers, chemicals, and even irrigation water particularly if it is pumped, are debited to the field card which is later credited with the tons of cane, beet, or better still, the sugar, it has produced. For ratoon sugar crops these cards are particularly valuable; they show when the cost of sugar per ton in the crop rises to an uneconomic level above the standard cost, as the weight of the annual

harvest falls off with successive ratoons.

Transport and handling of sugar crops are big items of expense; eight to ten tons of vegetable matter per ton of crystal sugar manufactured. Double handling is to be avoided. Beet is usually handled very simply; straight off the field into the vehicle that dumps it into the silos (concrete canals) at the factory, whence it is floated to huge beet pumps which lift it into the factory for mechanical slicing.

Cane tends to be handled too often; first hand-piled after hand-cutting; hand-loaded stick by stick on to a field vehicle; transferred to a road or rail vehicle by crane and later dumped or unloaded in the factory yard; then again picked up by crane and fed on to the cane table twelve to twenty-four hours later. There is no economic merit in this avoidable multiple handling, which is gradually disappearing.

The simplest way is for either hand-cut or machine-cut cane to be windrowed concurrently and grab-loaded half a ton or so at a bite, 24 hours a day, into vehicles capable of being taken straight to the factory for tipping on to the cane table and coming back at once for more. The expensive double or even triple handling of yard storage is avoided. An alternative where labour is highly paid is the powered cane harvester which cuts, chops, and loads, also 24 hours a day, trailers which can be hauled straight to the factory for almost immediate

tipping on to the cane table.

In the Factory

Accounting techniques started improving enormously about twenty years ago. Till then the accounts were so-called "financial" accounts and any "actual" costing that was carried out was quite separate and usually incomplete. Some items of overhead expenditure only appeared once a year in the old financial accounts and were either omitted, or estimated, for costing.

Modern accounting has the standard costing figures integrated with the accounts which are published monthly, but only audited once a year. This relatively new concept of accounting operates on added values. The raw material is the basic cost and all other expenditures incurred, including depreciation and loan interest, are added to the raw material and divided by the units of finished products produced each month.

Even in the seasonal sugar industry, with no manufacturing

for some months each year, modern monthly accounting provides the controls needed. In the off-season, the heavy maintenance programme is being carried out and the expenditure is accumulated in a capital account, which is written off monthly as an expense during the next campaign. Sales of sugar, molasses and perhaps beet pulp are continuing and are published in the monthly accounts too, which show the remaining stocks as well.

No multiplicity of ad hoc reports to the manager can be as reliable and useful as one set of suitably designed and up-to-date monthly accounts, in which all figures relate to the same instant in time - midnight on the last day of the previous "month" - which should be a period of four weeks. With integrated standard costing it is [illegible] that the physical quantities handled in the processing operations appear, too, in the monthly accounts for the campaign period.

It is desirable to allocate all expenditure to under a dozen cost centres for each factory; e.g., the receiving yard for the sugar harvest; the juice extraction process; liming, carbonatation and filtration; evaporation to thick juice; sugar boiling and the centrifugals; sugar drying, packaging and storage; administration, etc. An example is known of an

over-enthusiastic young cost accountant who divided his factory into more than one thousand cost centres. This must have meant that the maintenance of each stairway as well as each motor pump and pressure gauge was individually recorded. Who would have the time and interest for such detailed costing was not apparent.

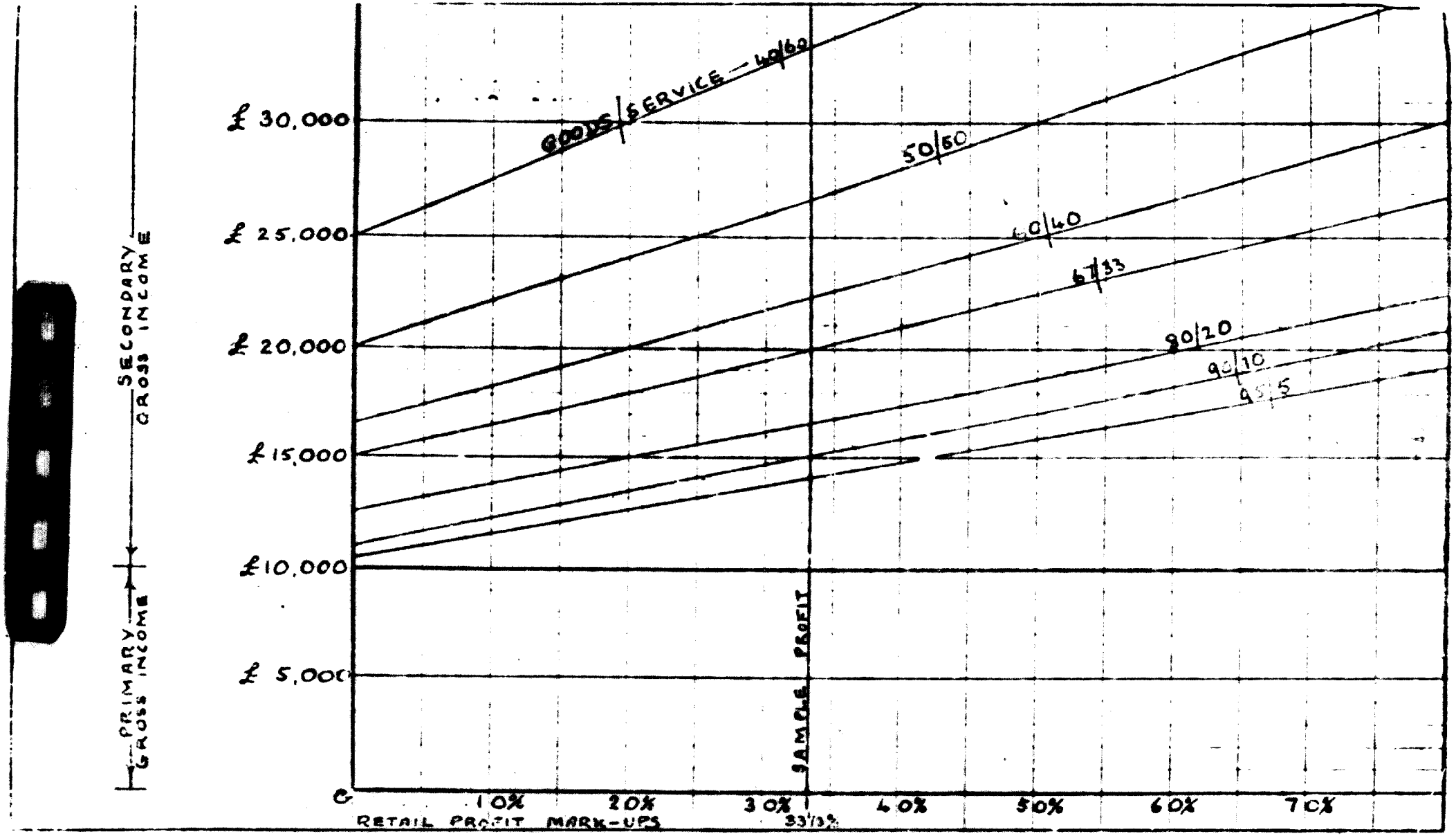
With just a few manageable cost centres, the actual standard costs per ton of crystal sugar processed during the campaign, and of off-season maintenance, can be usefully compared, stage by stage through the factory.

[illegible] Goods and Services by	Turnovers of purchasing powers	Purchases of replacement Goods at whole-sale prices	Disposable purchasing power of			Purchases of Goods from shop-keepers at retail prices	Disbursements on Services and Direct Taxes
			Farmers	Shop-keepers	Service Workers		
1	2	3	4	5	6	7	8
[illegible]	[illegible]	[illegible]	10,000	[illegible]	[illegible]	8,000	2,000
[illegible] turnovers, [illegible]op-keepers	8,000	6,000	-	2,000	-	1,600	400
[illegible] do. [illegible]ice Workers	2,000	-	-	-	2,000	1,600	400
[illegible] do. total	10,000	6,000	-	2,000	2,000	3,200	800
[illegible] do. [illegible]op-keepers	3,200	2,400	-	800	-	640	160
[illegible] do. [illegible]ice Workers	800	-	-	-	800	640	160
[illegible] do. total	4,000	2,400	-	800	800	1,280	320
[illegible] do. [illegible]op-keepers	1,280	960	-	320	-	256	64
[illegible] do. [illegible]ice Workers	320	-	-	-	320	256	64
[illegible] do. total	1,600	960	-	320	320	512	128
[illegible] do. [illegible]op-keepers	512	384	-	128	-	102	26
[illegible] do. [illegible]ice Workers	128	-	-	-	128	102	26
[illegible] do. total	640	384	-	128	128	204	52
[illegible] do. total	256	154	[illegible]	51	51	82	21
[illegible] do. do.	102	61	[illegible]	20	20	33	8
[illegible] do. do.	40	25	[illegible]	8	8	13	3
[illegible] do. do.	16	10	[illegible]	3	3	5	1
[illegible] do. do.	6	4	[illegible]	1	1	2	
[illegible] do. do.	3	2	[illegible]			1	
[illegible] do. do.	1	1	[illegible]				
[illegible] st[illegible]th turnovers [illegible]ren. total	16,664	10,001	-	3,231	3,231	13,332	3,333
[illegible] ct-[illegible] turnovers and [illegible] spending	16,667	10,000	10,000	3,333	3,333	13,333	3,333

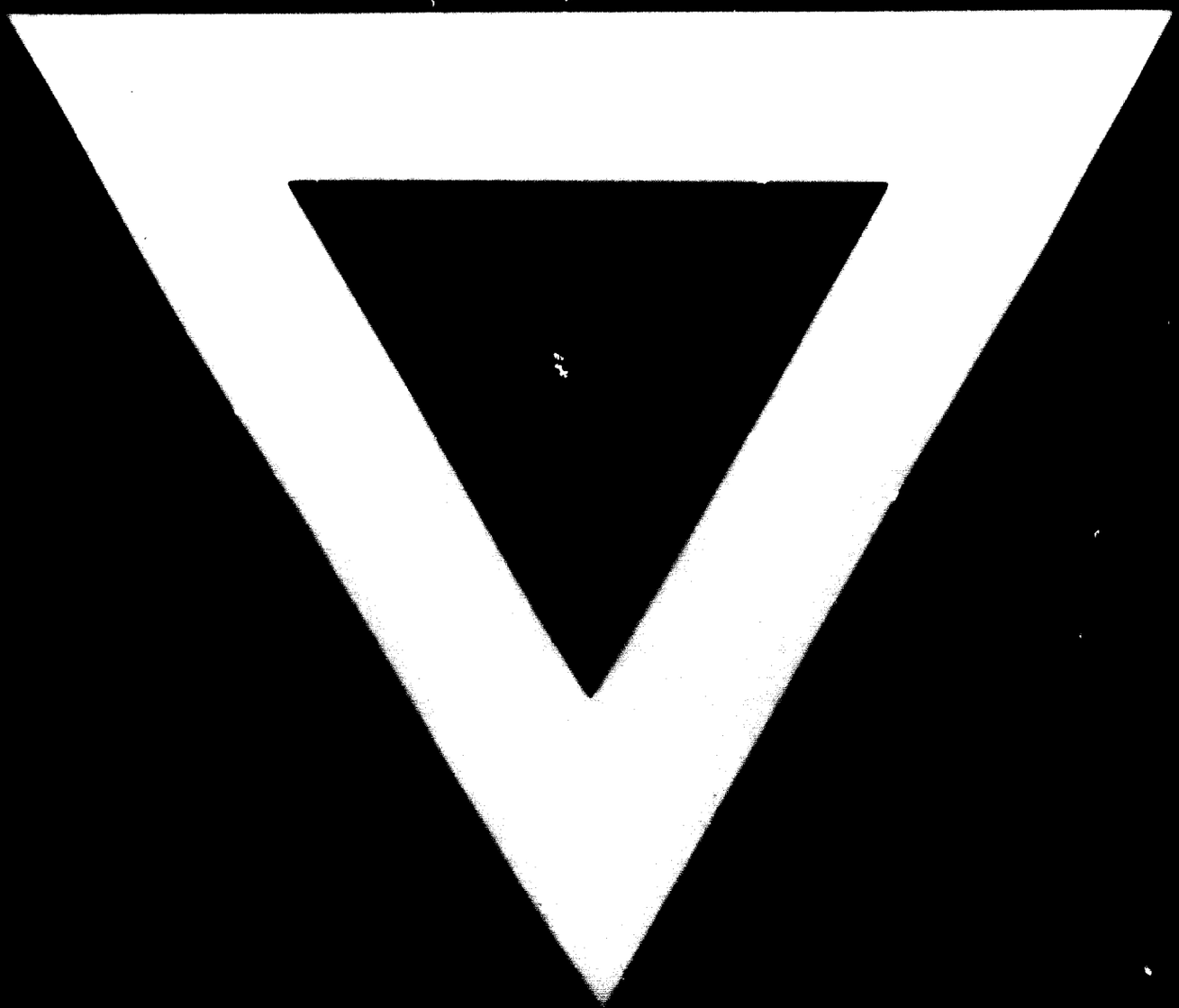
GSR is 80/20 and retail mark-up is 33.3%

Double Entry Postings
(a) Col. 3 total = Col. 4 total
(b) Col. 3 + Col. 5 = Col. 7, all totals
(c) Col. 7 + Col. 8 = Col. 2, do.

APPENDIX I SAMPLE CALCULATIONS IN STERLING ON A FINANCIAL MODEL OF CANE SUGAR FARMERS SPENDING £10,000 OF THEIR GROSS SALES INCOME IN THEIR REGIONAL MARKET TOWN



APPX II EFFECTS OF VARIABLES ON SECONDARY INCOMES



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